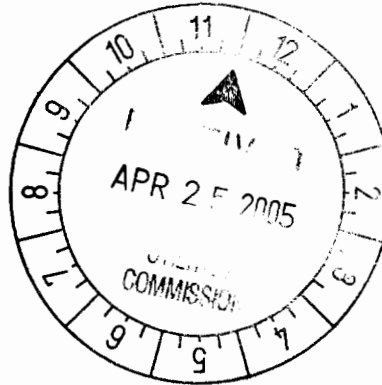




engineers  
planners  
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April 22, 2005

Ms. Debra A. Howland  
Executive Director and Secretary  
State of New Hampshire  
Public Utilities Commission  
21 S. Fruit Street, Suite 10  
Concord, NH 03301-2429

**Re: Investigation into Service Quality within the Town of Bedford, NH**  
**NHPUC Docket DE 03-113**  
**DH #2005037**

Dear Ms. Howland:

The following are our responses to the questions contained in your letter of April 5, 2005 to Mr. Peter Andrews of Dufresne-Henry.

**Question 1:** The report indicates that testing was only performed for six days. Please describe the testing protocols utilized and explain why a test duration of six days was employed rather than one month or longer.

**Response:** The test program procedures were to determine if the utility system voltage remained within the NHPUC voltage limits under normal operating conditions. We selected monitoring locations and identified certain capacitors and voltage regulators for selective removal to determine the impact on system voltage. We had a meeting with PSNH and NHPUC representatives to review our proposed testing, which PSNH accepted and subsequently implemented as described in our report. The Dufresne-Henry monitoring locations were selected to be neutral, relative to any previously reported voltage concerns, to provide information on the overall PSNH system. We also chose additional metering locations for simultaneous monitoring by PSNH.

Prior to the actual testing, Mr. Heneage conducted preliminary informal voltage monitoring, primarily at his residence on the Bedford 3W2 circuit, using the same AEMC PQL-120 and Cutler-Hammer PW-200 instruments used during the monitoring program. Measurements were taken continuously over an approximate two month period between April and the start of the two

monitoring runs. No abnormal voltage conditions were found, beyond those caused by the operation of typical customer equipment as measured on the customer side of the utility meter. These data files were not retained.

The two monitoring periods in the report covered representative daytime and nighttime load variations on both weekdays and weekends. We did not feel that longer testing periods would yield any more significant data. Based on our unofficial and official monitoring periods, it is our professional opinion that the two reported monitoring periods were of adequate duration to determine the system voltage characteristics under varying system load conditions.

There is one caveat however, while we did not identify any broad systemic problems, it does not eliminate the possibility that localized problems may exist and require individual diagnosis and correction at individual customer locations where voltage problems have been reported.

**Question 2:** The report states that the Bedford electrical system is typical of other utilities this size with the exception of the many circuit feeders. What, if any, effect do multiple circuit feeders have on system performance in Bedford?

**Response:** In our experience, we typically see multiple feeders from one or more substations within a single community. The Bedford distribution system has one substation with two outgoing 12.47 kV feeders that serve a portion of the town. It also has a number of 34.5 kV feeders that originate from transmission line taps both inside Bedford and from neighboring towns. A feeder operating at 34.5kV can carry more load and extend for a longer distance than a comparable 12.47 kV feeder. The present feeder configuration appears to be a result of cumulative load growth in the town.

The advantage of multiple feeder circuits is that the Bedford customer base is divided into smaller sections with each fed by an individual feeder. An outage on a single feeder would affect fewer customers, in a smaller geographic area, than if the town was served by fewer feeders, each covering more customers in larger areas.

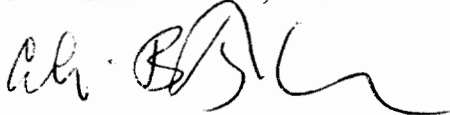
In a growing area, new feeders may be added to serve a small number of customers and may not initially be the most economical approach. In most cases, this is the most practical approach for a utility to respond to the random nature of development on many electric distribution systems. Utility companies regularly analyze and modify distribution feeders to maintain the overall system voltages within the tolerances required by good operating practices and utility regulations.

In summary, multiple feeders do not, in themselves, present any adverse power quality issue and their use is a standard industry practice.

Please contact us if you have any further questions.

Regards,

DUFRESNE-HENRY, INC.

A handwritten signature in black ink, appearing to read 'Colin B. Taylor', with a stylized flourish at the end.

Colin B. Taylor, P. E.  
Senior Consultant

C: Thomas C. Frantz, NHPUC  
Peter N. Andrews  
File